STATEMENT OF BASIS
CLASS IID PERMIT APPLICATION
DUGAN PRODUCTION CORPORATION

U.S. Environmental Protection Agency, Region IX (EPA)
Underground Injection Control (UIC) Permit NN207000003
West Bisti SWD #1 Class IID Injection Well
San Juan County, New Mexico
Lease No. NMSF-078155

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BACKGROUND INFORMATION

Dugan Production Corporation ("Applicant") is applying for a permit to construct and operate a Class II disposal well located on Navajo Nation lands (surface only) in Section 35, Township 26 North, Range 13 West in San Juan County, New Mexico. The well is identified as the West Bisti SWD #1. The Permittee has applied for a permit to allow well construction and operation at an average injection rate of 5000 barrels per day and a maximum injection rate of 6000 barrels per day.

The EPA has decided to approve this permit, pending public review and comment, and is now issuing a Draft Permit. The permit will be issued for a period of ten (10) years unless the permit is terminated or modified for reasonable cause (40 CFR §§144.39, 144.40, and 144.41). The permit will be reviewed by EPA every five years.

The source of injection water will be water produced in association with oil and gas production from current and future Gallup and Fruitland Coal Formation wells operated by Dugan. The average total dissolved solids (TDS) content of formation waters ranges from 9,640 to 16,640 ppm (Fruitland Coal) and 30,760 ppm (Gallup), based on fluid analyses from two Fruitland and one Gallup source well in the area. The water will be injected into the Entrada Sandstone at a depth of

approximately 6915 to 7115 feet. The Entrada Formation waters contain TDS in excess of 10,000 ppm, based on the New Mexico Bureau of Mines and Mineral Resources Hydrologic Report 6 (1983).

The Applicant has notified all interested parties within the ½-mile radius area of review, which includes the local landowners, land-users, Navajo Nation, Bureau of Land Management, Bureau of Indian Affairs, and the State of New Mexico.

The Applicant has also requested a permit from Navajo Nation EPA (NNEPA, Permit No. NN 17) for drilling, construction, and operation of this same Class II disposal well. Issuance of this NNEPA permit is currently under review by NNEPA and is pending. Furthermore, the State of New Mexico Conservation Division issued a salt water disposal permit for this well effective February 21, 2007.

This Statement of Basis describes the specific permit conditions and the basis for those conditions under authority of the Underground Injection Control (UIC) regulations and the UIC provisions of the Safe Drinking Water Act.

BRIEF SUMMARY OF PART II. SPECIFIC PERMIT CONDITIONS

SECTION A. WELL CONSTRUCTION

1. Casing and Cementing

The wellbore schematic diagram can be seen in Appendix C of the permit.

The proposed surface casing is 8-5/8 inches in diameter, set at 480 feet and cemented to the surface with 300 cubic feet (220 sacks) of cement. The proposed long string casing is 5-1/2 inches in diameter, set at 7165 feet and cemented with 1540 cubic feet (750 sacks) from 7165 feet of depth (TD) to the surface. The proposed internal plastic coated tubing is 2-7/8 inches in diameter, set with an injection packer assembly at 6865 feet of depth. All setting depths and cement volumes are approximate and are subject to minor modification after the well is drilled and completed.

The injection zone is overlain by 20 feet of impervious inter-bedded anhydrite and thin bedded limestone of the Todilto Formation, and underlain by tight silty shale and siltstone of the Chinle Formation, providing confining layers to the injection zone at 6915 to 7115 feet of depth. Based on calculations from well log data, the Chacra/Cliff House Formation, located at a depth of approximately 2040 feet (base at 2520 feet), may be an underground source of drinking water (USDW) in this area. Calculations from the electric logs run in other wells in the area indicate that it is a USDW. Similar calculations will be performed from the logs to be run in the proposed well in order to assess whether the Chacra/Cliff House Formation is a USDW. The Ojo Alamo Formation, at approximately 75 feet of depth is a known USDW, and the Nacimiento Formation cropping-out at the surface, may also be a USDW.

The USDWs are protected from the inflow of fluids by surface and long string casing and cement placement in the casing/wellbore annulus of both casing strings, from the casing shoe at total depth (TD) to the surface. The tubing/packer assembly also provides another layer of protection from inflow of injected fluids into the USDWs.

2. Formation Logging and Testing

The static fluid level and/or injection zone pressure must be measured and reported to the EPA on an annual basis. A step-rate injectivity test may be required for the determination of formation fracture pressure if the applicant seeks to exceed the maximum allowable injection pressure during the life of the well. A Dual Induction Log (DIL) will be run from total depth (TD) to surface, and Gamma Ray/Compensated Neutron Log/Compensated Density Logs (GR/CNL/CDL), a Micro Log (ML), and Cement Bond Log/Gamma Ray (CBL/GR) logs will be run from TD to the bottom of surface casing. A pressure fall-off test will be conducted within thirty (30) days of commencing injection, for the determination of hydraulic conductivity of the injection zone.

3. Monitoring Devices

The Applicant is required to install FIP fittings with cut-off valves to allow an inspector to obtain injection pressure measurements. A flowmeter shall be installed for measuring flow rates and cumulative volumes injected. A sampling tap shall be installed on the injection pump discharge line for the purpose of periodically obtaining representative samples of the injection fluid. Casing and tubing pressures will be monitored at the surface on a weekly basis by means of pressure/vacuum gauges.

SECTION B. CORRECTIVE ACTION

An Area of Review (AOR) of one-half (½) mile radius from the proposed well has been assumed by the Applicant; however, the Zone of Endangering Influence (ZEI) has yet to be determined and may extend beyond the AOR. It is not possible to calculate the ZEI without an evaluation of the injection zone after the well is drilled, logged, completed and tested. If the ZEI determination ('r') exceeds the assumed AOR, the AOR may be enlarged and additional wells in the expanded AOR could be subject to corrective action. However, the applicant reports that there are no well penetrations of the Entrada Formations in the study area of the proposed well, which is a nine square mile area surrounding the proposed well. The permit will be issued based on corrective action considerations associated with an assumed one-half mile AOR, but will be subject to final review and possible modification after the well is drilled and completed.

Based on the one-half mile radius AOR, no corrective action in surrounding wells is required of the Applicant because no wells within the proposed AOR penetrate the Entrada injection zone. In addition, the #149 West Bisti Unit water source well, which produced water from the Mesaverde Formation at 2540 feet of total depth, is properly plugged and abandoned. Therefore, migration of injected fluids in the proposed well into USDWs is highly unlikely without the existence of communicating faults or fractures that extend from the injection zone more than 4000 feet upward to the base of the lowermost possible USDW (Chacra/Cliff House). No such faults or fractures are known to exist within the AOR.

The extent of reservoir pressure buildup will be monitored annually during the term of the permit. Corrective actions will be taken to minimize pressure buildup over the permit term if it may endanger USDWs.

SECTION C. WELL OPERATION

1. Mechanical Integrity

A mechanical integrity test (MIT) of the casing, tubing, and packer will be conducted prior to commencement of injection operations in the well. The purpose of this test is to ensure there are no significant leaks in the tubing, packer, and casing. The pressure test will require applying a pressure at least equal to the maximum allowable injection pressure in the tubing/casing annulus for thirty (30) minutes with no more than 5% change in pressure. A differential of at least three-hundred (300) psig between the tubing and tubing/casing annulus will be maintained throughout the test. Maximum allowable injection pressure is estimated by multiplying the actual depth to the top of the injection interval by 0.2 psi/foot, and may be later adjusted downward, based on fracture treatment of the injection zone, or upward, based on a valid EPA-approved step-rate test. Demonstrations of mechanical integrity of the injection tubing and casing will be required every five (5) years and within thirty (30) days after any workovers or alterations of the wellbore, prior to resuming injection.

2. Injection Interval(s)

Injection will be permitted for the Entrada Sandstone in the subsurface interval at approximately 6915 to 7115 feet. Any proposed change of injection formation or enlargement of this interval will require a permit modification, subject to public notice, comment and appeal.

3. Injection Pressure Limitation(s)

The wellhead injection pressure shall not exceed the maximum allowable injection pressure, initially calculated by multiplying the actual depth to the top of the injection interval by 0.2 psi/foot. The actual formation fracture gradient may be determined during a fracture treatment of the injection zone, and the maximum allowable injection pressure may be decreased at that time, depending on the results of that determination.

Injection pressure may be increased only if a valid step-rate test is conducted by the operator

and is approved by the EPA. Injection pressure shall not exceed the fracture pressure of the injection zone as determined by the EPA from the analysis of step-rate test results.

4. Injection Volume (Rate) Limitation:

The proposed average injection rate is 5000 barrels per day and the proposed maximum injection rate is 6000 barrels per day. The cumulative volume that would be injected into the Entrada interval, assuming the average injection rate of 5000 barrels per day is applied over the 10 year term of the permit, equals 18.25 million barrels. The storage capacity of the Entrada injection zone within the proposed area of review (AOR) is an estimated 102.36 million barrels. The outward migration of injected fluid will be contained within the AOR and within a circular area defined by a radius ('r') of 1115 feet from the wellbore, based on estimates of Entrada Sandstone properties and injection zone thickness. The proposed AOR is defined by a circle with a radius of 2640 feet from the wellbore. The above calculations are based on the following assumptions: a homogeneous injection zone, radial flow, average effective porosity of 17.5%, residual water saturation of 25%, and net thickness of 200 feet. Actual values of average effective porosity and net thickness will be determined from the DIL, ML, and compensated density/neutron log analysis after the well is drilled. The actual AOR may be enlarged at that time, based on a calculation of the radius ('r') of the ZEI, which is dependent on those and other factors that will be determined after the well is drilled and completed.

The potential for migration of formation fluids out of the injection zone and into USDWs will be limited by the fact that none of the wells in the proposed AOR penetrate the injection zone and there are no known faults or fractures that would allow migration of fluids into USDWs within the proposed AOR. Endangerment of USDWs from migration of injected and formation fluids is therefore unlikely. Pressure build-up in the injection zone will be monitored annually during the term of the permit, and corrective actions will be taken if pressure build-up may endanger USDWs.

SECTION D - MONITORING, RECORD KEEPING, AND REPORTING OF RESULTS

The Applicant is required to sample and analyze the water quality of the injected fluids at annual intervals and whenever the source of the injection fluid changes. Water samples shall be analyzed for TDS, major ions, pH, specific conductivity, specific gravity, and viscosity. Measurements of the injection pressure, annulus pressure, injection rate, and cumulative volume must be observed weekly and recorded at least once per month. The Applicant is required to submit an Annual Monitoring Report to the EPA summarizing the monitoring of injection rates, volumes, pressures, and injected fluid, and any major changes in the characteristics or sources of injected fluid. Static fluid levels and/or pressures will be measured and will be reported to the EPA on an annual basis.

SECTION E - PLUGGING AND ABANDONMENT

The EPA has reviewed the plugging and abandonment (P&A) plan submitted by the applicant. The P&A plan is incorporated into the permit as Appendix A. The current estimated cost of plugging and abandoning the well is $31,000; however, it will be reviewed periodically to ensure that the P&A cost estimate remains current and accurate. The plugging plan and procedure will be reviewed prior to commencement of plugging operations to ensure that the well is abandoned in a manner that protects USDWs.

SECTION F - FINANCIAL RESPONSIBILITY

The Applicant has furnished an Irrevocable Standby Letter of Credit (Wells Fargo Bank, NA # NZS592729 in the amount of $36,000 which, with an associated standby trust agreement, is currently sufficient to guarantee costs of plugging and abandoning the subject well in the event the Applicant fails to properly plug and abandon the well, whenever that becomes necessary. The EPA is the specified beneficiary of the aforementioned surety instruments. The EPA will review and may require updating of the financial responsibility mechanism periodically as plugging and abandonment costs increase, or as other circumstances may require.